

ABSTRACT

A patterned phosphor structure, and EL laminate containing same, forming red, green and blue sub-pixel phosphor elements for an AC electroluminescent display. The patterned phosphor structure includes at least a first and a second phosphor emitting light in different ranges of the visible spectrum, but with combined emission spectra contains red, green and blue light, the first and second phosphors being in a layer, arranged in adjacent, repeating relationship to each other to provide a plurality of repeating first and second phosphor deposits. The phosphor structure also includes one or more means associated with one or more of the first and second phosphor deposits, and which together with the first and second phosphor deposits, form the red, green and blue sub-pixel phosphor elements, for setting and equalizing the threshold voltages of the red, green and blue sub-pixel phosphor elements, and for setting the relative luminosities of the red, green and blue sub-pixel phosphor elements so that they bear set ratios to one another at each operating modulation voltage used to generate the desired luminosities for red, green and blue. Photolithographic methods for producing the patterned phosphor structure are also provided. Also provided is an improved dielectric layer for use in an EL laminate, including a pressed, sintered ceramic material having, compared to an unpressed, sintered dielectric layer of the same composition, improved dielectric strength, reduced porosity and uniform luminosity in an EL laminate. Also provided are combined substrate and dielectric layer components or EL laminates containing the pressed thick film dielectric layer, and methods of forming the pressed thick film dielectric layer. A process is also provided for synthesizing strontium sulfide phosphors by providing a source of high purity strontium carbonate in a dispersed form, heating the strontium carbonate in a reactor with gradual heating up to a maximum temperature in the range of 800 to 1200°C, contacting the heated strontium carbonate with a flow of sulfur vapours formed by heating elemental sulfur in the reactor to at least 300°C in an inert atmosphere; and terminating the reaction by stopping the flow of sulfur at a point when sulfur dioxide or carbon dioxide in the reaction gas reaches an amount which correlates with an amount of oxygen in oxygen-containing strontium compounds in the reaction product which is in the range of 1 to 10 atomic percent.